

ABSTRACT OF THE DISCLOSURE

[0068] A system and method for monitoring the concentration of a medium in at least one container using photothermal spectroscopy. The medium can be a gas, such as oxygen or carbon dioxide, or a solid or liquid. The system and method each employs an energy emitting device, such as a laser or any other suitable type of light emitting device, which is adapted to emit a first energy signal toward a location in the container. The first energy signal has a wavelength that is substantially equal to a wavelength at which the medium absorbs the first energy signal so that absorption of the first energy signal changes a refractive index of a portion of the medium. The system and method each also employs a second energy emitting device, adapted to emit a second energy signal toward the portion of the medium while the refractive index of the portion is changed by the first energy signal, and a detector, adapted to detect a portion of the second energy signal that passes through the portion of the medium. The system and method each further employs a signal analyzer, adapted to analyze the detected portion of the second energy signal to determine an amount of a sample in the container based on a concentration of the medium in the container. In particular, the signal analyzer can analyze the detection portion of the second energy signal to determine whether the sample includes an organism which consumes or emits the medium.